

What is claim is:

1. A multichip module structure, at least comprising:

a first multichip module substrate, comprising:

an semiconductor substrate having a first surface and a second  
5 surface;

an insulating layer being on said first surface;

a multilayer interconnection structure being on said insulating  
layer and having a third surface having a plurality of first  
bonding pads and a fourth surface having a plurality of  
10 second bonding pads and contacting said insulating layer;

a plurality of conductive plugs penetrating said semiconductor  
substrate and said insulating layer and electrically  
connecting to said second bonding pads respectively;

a plurality of third bonding pads being on said second surface  
15 and connecting to said conductive plugs respectively; and

a plurality of chips being on said second surface and electrically  
connecting to said third bonding pads.

2. The multichip module structure according to claim 1, wherein said  
multilayer interconnection structure includes at least one integrated  
20 circuit device.

3. The multichip module structure according to claim 1, wherein said  
semiconductor substrate has a thickness between 10 to 500 micron  
meter.

4. The multichip module structure according to claim 1, wherein said chip is an active chip.
5. The multichip module structure according to claim 4, wherein said active chip is mounted on said second surface by flip-chip type.
- 5 6. The multichip module structure according to claim 1, wherein said chip is a passive chip.
7. The multichip module structure according to claim 1, wherein said chips individually and electrically connect to said third bonding pads.
8. The multichip module structure according to claim 1, wherein said  
10 chips comprise a first active chip mounted on said first multichip module substrate by flip-chip type, and at least one chip electrically connecting and stacking on a backside of a first active chip.
9. The multichip module structure according to claim 8, wherein said at least one chip comprises a second active chip mounted on said  
15 backside of said first active chip by flip-chip type.
10. The multichip module structure according to claim 8, wherein said at least one chip comprises a passive chip.
11. The multichip module structure according to claim 1, further comprising a second multichip module substrate on said third surface,  
20 wherein said second multichip module substrate has a same structure as said first multichip module substrate.
12. The multichip module structure according to claim 1, wherein said multichip module structure is further electrically connected with a circuit board on said third surface.

13. A method for forming a multichip module structure, said method comprising:

providing a semiconductor substrate having a first surface and a second surface;

5 forming an insulating layer on said first surface;

forming a multilayer interconnection structure on said insulating layer, said multilayer interconnection structure comprising a third surface having a plurality of first bonding pads and a fourth surface having a plurality of second bonding pads, and contacting said insulating layer;

10

forming a plurality of conductive holes penetrating said semiconductor substrate and said insulating layer and electrically connecting to said second bonding pads respectively;

15

forming a plurality of third bonding pads on said second surface, wherein each said third bonding pad connects to said conductive plugs respectively; and

mounting a plurality of chips on said second surface to electrically connect said third bonding pads.

20

14. The method according to claim 13, wherein said multilayer interconnection structure includes at least one integrated circuit device.

15. The method according to claim 13, further comprising a step of polishing said semiconductor substrate on said second surface to

reduce a thickness of said semiconductor substrate to 10 to 500 micron meter.

16. The method according to claim 13, wherein said chip is an active chip.

5 17. The method according to claim 16, wherein said active chip is mounted on said second surface by flip-chip type.

18. The method according to claim 13, wherein said chip is a passive chip.

19. The method according to claim 13, wherein said chips individually and electrically connect to said third bonding pads.

10 20. The multichip module structure according to claim 13, wherein said chips comprise a first active chip mounted on said first multichip module substrate by flip-chip type, and at least one chip electrically connecting and stacking on a backside of a first active chip.

15 21. The method according to claim 20, wherein said at least one chip comprises a second active chip mounted on said backside of said first active chip by flip-chip type.

22. The method according to claim 20, wherein said at least one chip comprises a passive chip.

20 23. The method according to claim 13, further comprising mounting a circuit board on said third surface.

24. The method according to claim 13, further comprising mounting a second multichip module substrate on said third surface, wherein said second multichip module substrate has a same structure as said first multichip module substrate.